CLAIMS

1. High-temperature solid electrolyte fuel cell comprising an electrolyte layer between two electrode layers obtainable by a process comprising the steps:
(i) applying electrolyte particles in a screen printing paste onto an unsintered electrolyte and sintering the thus produced structure,
(ii) depositing a nano-porous electrode thin layer by a sol-gel-process or an MOD-process on the structure obtained according to step (i) and the thermal treatment of the thus coated structure.

2. High-temperature solid electrolyte fuel cell according to claim 1 characterized in that an electrolyte of yttrium or scandium doped ZrO_2 is used in step (i).

3. High-temperature solid electrolyte fuel cell according to claim 1 or 2 characterized in that a paste comprising doped zirconium dioxide (yttrium or scandium doped) or doped cerium oxide (yttrium, gadolinium or samarium doped) is used as screen printing paste.

4. High-temperature solid electrolyte fuel cell according to claim 3 characterized in that the screen printing paste has a solid content of 10 to 30 wt.-%.

5. High-temperature solid electrolyte fuel cell according to claim 3 or 4 characterized in that the granule size distribution of the powder fraction of the paste is in the range of 5 to 20 µm.

6. High-temperature solid electrolyte fuel cell according to claims 1 to 5 characterized in that it further comprises an electrolyte boundary layer on the structured screen printed

electrolyte layer obtained according to step (i), which is applied by an MOD process.

7. High-temperature solid electrolyte fuel cell according to claims 1 to 6 characterized in that a layer comprising strontium doped lanthanum cobaltate (LSC) $La_{0.50}Sr_{0.50}CoO_3$ is deposited in step (ii).

8. High-temperature solid electrolyte fuel cell according to claims 1 to 6 characterized in that a layer comprising sub-stochiometric strontium doped lanthanum manganate (ULSM) $La_{0.75}Sr_{0.20}MnO_3$ is deposited in step (ii).

9. High-temperature solid electrolyte fuel cell according to claim 7 or 8 characterized in that the solid content of the LSM coating solution and the solid content of the ULSM coating solution is 12-14 mass %, respectively.